(c) a polypeptide of (a) or (b) which has been modified without loss of immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).

2. (Amended) A nucleic acid molecule comprising a nucleic acid sequence selected from any one of:

C1

(a) SEQ ID No: 6;

(b) a sequence which encodes a polypeptide encoded by SEQ ID No: 6;

(c) a sequence comprising at least 38 consecutive nucleotides from any one of the nucleic acid sequences of (a) and (b); and

(d) a sequence which encodes a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 6.

4. (Amended) A nucleic acid molecule comprising a nucleic acid sequence which encodes a fusion protein, said fusion protein comprising a first polypeptide and a second polypeptide, wherein the first polypeptide is selected from any one of:

(a) SEQ ID No: 14;

C2

(b) an immunogenic fragment comprising at least 12 consecutive amino acids from a polypeptide of SEQ ID No: 14; and

(c) a polypeptide of (a) or (b) which has been modified without loss of immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).

7. (Amended) The nucleic acid molecule of claim 1, operatively linked to one or more expression control sequences.

C3

8. (Amended) A vaccine comprising a vaccine vector and at least one first nucleic acid selected from any of:

(i) SEQ ID No: 6;

(ii) a nucleic acid sequence which encodes a polypeptide encoded by SEQ ID No: 14;

(iii) a nucleic acid sequence comprising at least 38 consecutive nucleotides from any one of the nucleic acid sequences of (i) and (ii);

(iv) a nucleic acid sequence which encodes a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by any one of SEQ ID No: 6;

(v) a nucleic acid sequence which encodes a polypeptide whose sequence is set forth in SEQ ID No: 14;

(vi) a nucleic acid sequence which encodes an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No: 14;

(vii) a nucleic acid sequence which encodes a polypeptide as defined in (i) to (v) or an immunogenic fragment as defined in (vi) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (v) or the corresponding fragment of (vi);

C3

wherein each first nucleic acid is capable of being expressed.

9. (Amended) A vaccine comprising a vaccine vector and at least one first nucleic acid encoding a fusion protein, wherein the fusion protein comprises:

(a) a first polypeptide selected from any of:

(i) a polypeptide encoded by SEQ ID No: 6;

(ii) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 6;

(iii) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 6;

(iv) a polypeptide whose sequence is set forth in SEQ ID No: 14;

(v) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No: 14; and

C13 (vi) a polypeptide as defined in (i) to (iv) or an immunogenic fragment as defined in (v) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (iv) or the corresponding fragment of (v); and

(b) a second polypeptide;

wherein each first nucleic acid is capable of being expressed.

C14 13. (Amended) The vaccine of claim 8 wherein each first nucleic acid is expressed as a polypeptide, and wherein the vaccine comprises a second nucleic acid encoding an additional polypeptide which enhances the immune response to the polypeptide expressed by the first nucleic acid.

15. (Amended) A pharmaceutical composition comprising the nucleic acid of claim 1 and a pharmaceutically acceptable carrier.

C15 16. (Amended) A pharmaceutical composition comprising the vaccine of claim 8 and a pharmaceutically acceptable carrier.

C16 18. (Amended) An isolated nucleic acid probe of 5 to 100 nucleotides which hybridizes under stringent conditions to the nucleic acid molecule of SEQ ID No: 6, or to a complementary or anti-sense sequence of said nucleic acid molecule.

19. (Amended) An isolated primer of 10 to 40 nucleotides which hybridizes under stringent conditions to the nucleic acid molecules of SEQ ID No: 6, or to a complementary or anti-sense sequence of said nucleic acid molecule.

20. (Amended) A polypeptide encoded by the nucleic acid sequence of claim 2.

21. (Amended) A polypeptide comprising an amino acid sequence selected from any of:

(a) SEQ ID No: 14;

(b) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ 14; and

(c) a polypeptide of (a) or (b) which has been modified without loss of immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).

22. (Amended) A fusion polypeptide comprising a first polypeptide and a second polypeptide, wherein the first polypeptide is selected from any one of:

(a) a polypeptide encoded by SEQ ID No: 6;

(b) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 6;

(c) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 6;

(d) a polypeptide whose sequence is set forth in SEQ ID No: 14;

(e) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No: 14; and

(f) a polypeptide as defined in (a) to (d) or an immunogenic fragment as defined in (e) which has been modified without loss of immunogenicity, wherein said

C8 modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (a) to (d) or the corresponding fragment of (e).

C9 25. (Amended) A method for producing the polypeptide of claim 20, comprising the step of culturing a unicellular host transformed with a nucleic acid encoding the polypeptide of claim 20.

27. (Amended) A vaccine comprising at least one first polypeptide selected from any of:

(i) a polypeptide encoded by SEQ ID No: 6;

(ii) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 6;

(iii) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 6;

C10 (iv) a polypeptide whose sequence is set forth in SEQ ID No: 14;

(v) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No: 14; and

(vi) a polypeptide as defined in (i) to (iv) or an immunogenic fragment as defined in (v) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (iv) or the corresponding fragment of (v).

28. (Amended) A vaccine comprising at least one fusion protein, wherein the fusion protein comprises:

(a) a first polypeptide selected from any of:

(i) a polypeptide encoded by SEQ ID No: 6;

(ii) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 6;

(iii) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 6;

(iv) a polypeptide whose sequence is set forth in SEQ ID No: 14;

C10 (v) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No: 14; and

(vi) a polypeptide as defined in (i) to (iv) or an immunogenic fragment as defined in (v) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (iv) or the corresponding fragment of (v); and

(b) a second polypeptide.

33. (Amended) A pharmaceutical composition comprising the polypeptide of claim 20 and a pharmaceutically acceptable carrier.

C11 34. (Amended) A pharmaceutical composition comprising the vaccine of claim 27 and a pharmaceutically acceptable carrier.

C12 35. (Amended) A pharmaceutical composition comprising the antibody of claim 26 and a pharmaceutically acceptable carrier.

36. (Amended) A method for preventing or treating *Chlamydia* infection comprising administering to a patient an effective amount of:

C13 (a) the nucleic acid of claim 2;

(b) a vaccine comprising a vaccine vector and at least one first nucleic acid of claim 2;

(c) a pharmaceutical composition comprising the nucleic acid of claim 2 and a pharmaceutically acceptable carrier;

(d) a polypeptide encoded by the nucleic acid of claim 2; or

(e) an antibody against a polypeptide encoded by a nucleic acid of claim 2.

37. (Amended) A method of detecting *Chlamydia* infection comprising the step of contacting a body fluid of a mammal to be tested, with a component selected from any one of:

(a) the nucleic acid according to claim 2;

C13 (b) a polypeptide encoded by the nucleic acid of claim 2; and

(c) an antibody against a polypeptide encoded by the nucleic acid of claim 2.

38. (Amended) A diagnostic kit comprising instructions for use and a component selected from any one of:

(a) the nucleic acid according to claim 2;

(b) a polypeptide encoded by the nucleic acid of claim 2; and

— (c) an antibody against a polypeptide encoded by the nucleic acid of claim 2.

39. (Amended) A method for identifying the polypeptide of claim 20 which induces an immune response effective to prevent or lessen the severity of *Chlamydia* infection in a mammal previously immunized with polypeptide, comprising the steps of:

(a) immunizing a mouse with the polypeptide of claim 20; and

(b) inoculating the immunized mouse with *Chlamydia;*